



## Department of Energy

Washington, DC 20585

April 3, 2024

Mr. Dennis Carr  
President and Chief Executive Officer  
Savannah River Site  
Savannah River Nuclear Solutions, LLC  
203 Laurens Street SW  
Aiken, South Carolina 29801

WEA-2024-02

Dear Mr. Carr:

This letter refers to the Department of Energy's (DOE) investigation into the facts and circumstances associated with the December 1, 2022, worker hand injury at the Savannah River Site. The DOE Office of Enterprise Assessments' Office of Enforcement provided the results of the investigation to Savannah River Nuclear Solutions, LLC (SRNS) in an investigation summary, dated November 15, 2023. An enforcement conference was convened on January 23, 2024, with you and members of your staff to discuss the findings outlined in the summary and SRNS's response. A summary of the enforcement conference and attendance roster are enclosed.

DOE considers the hand injury event to be of high safety significance. The event occurred when an SRNS employee caught their right hand between the fan belt and fan sheave of an air handling unit while performing troubleshooting and diagnostic activities. The injury resulted in amputation injuries to the tips of the right middle and ring fingers followed by additional bone and tissue loss during surgical treatment. The event revealed deficiencies in: (1) management responsibilities and training and information; and (2) hazard identification and assessment and safety and health standards.

Based on an evaluation of the evidence in this matter, including information presented at the enforcement conference, DOE concludes that SRNS violated requirements prescribed under 10 C.F.R. Part 851, *Worker Safety and Health Program*. Accordingly, DOE hereby issues the enclosed Preliminary Notice of Violation (PNOV) which cites two Severity Level I violations with a total base civil penalty, before mitigation, of \$236,000.

SRNS conducted a root cause analysis that included an extent-of-condition review and a corrective action plan. The Office of Enforcement determined that while SRNS's corrective actions were timely, they did not completely address the noncompliances identified in the PNOV related to management responsibilities and training and information. Specifically, the modifications to the training and qualification program modules, procedures, and lessons learned for maintenance work did not address the removal of the hazard (e.g., belts or chains) to prevent hand injuries. Therefore, the Office of Enforcement grants 42 percent reduction in the base civil penalty of the



Severity Level I violation related management responsibility and training and information.

The Office of Enforcement determined that SRNS's corrective actions related to hazard identification, assessment, and safety and health standards were timely and appear to adequately address the noncompliances in these areas. If adequately implemented and maintained by SRNS, the corrective actions should be sufficient to prevent recurrence of the conditions that lead to this event. Therefore, the Office of Enforcement grants 50 percent reduction in the base civil penalty of this Severity Level I violation.

As a result, the total proposed civil penalty is \$127,440.

Pursuant to 10 C.F.R. § 851.42, *Preliminary Notice of Violation*, you are obligated to submit a written reply within 30 calendar days of receipt of the enclosed PNOV and to follow the instructions specified in the PNOV when preparing your response. If you fail to submit a reply within the 30 calendar days, then in accordance with 10 C.F.R. § 851.42(d), you relinquish any right to appeal any matter in the PNOV, and the PNOV, including the proposed civil penalty assessment, will constitute a final order.

After reviewing your reply to the PNOV, including any proposed additional corrective actions entered into DOE's Noncompliance Tracking System, DOE will determine whether any further activity is necessary to ensure compliance with DOE worker safety and health requirements. DOE will continue to monitor the completion of corrective actions until this matter is fully resolved.

Sincerely,



Anthony C. Pierpoint  
Director  
Office of Enforcement  
Office of Enterprise Assessments

Enclosures: Preliminary Notice of Violation (WEA-2024-02)  
Enforcement Conference Summary and Attendance Roster  
Electronic Payment Processing Instructions

cc: Tamara Baldwin, Savannah River Nuclear Solutions, LLC  
Michael Budney, DOE-SR

**Preliminary Notice of Violation**

Savannah River Nuclear Solutions, LLC  
Savannah River Site

WEA-2024-02

A U.S. Department of Energy (DOE) investigation into the facts and circumstances associated with the December 1, 2022, worker hand injury at the Savannah River Site revealed violations of DOE worker safety and health requirements by Savannah River Nuclear Solution (SRNS). The event occurred at H-Area, building 221 during corrective maintenance of an air handling unit, when a worker's right middle and ring fingertips were caught between an unguarded fan belt and sheave, resulting in amputation of the fingertips.

DOE provided SRNS with an investigation summary, dated November 15, 2023, and convened an enforcement conference with SRNS representatives on January 23, 2024, to discuss the preliminary findings outlined in the summary and SRNS's response.

Pursuant to Section 234C of the Atomic Energy Act of 1954, as amended, and DOE regulations set forth at 10 C.F.R. Part 851 (Part 851), *Worker Safety and Health Program*, DOE hereby issues this Preliminary Notice of Violation (PNOV) to SRNS. The violations include deficiencies in: (1) management responsibilities and training and information; and (2) hazard identification and assessment and safety and health standards. DOE has grouped and categorized the violations as two Severity Level I violations.

Severity Levels are explained in Part 851, Appendix B, *General Statement of Enforcement Policy*. Subparagraph VI(b)(1) states that “[a] Severity Level I violation is a serious violation. A serious violation shall be deemed to exist in a place of employment if there is a potential that death or serious physical harm could result from a condition which exists, or from one or more practices, means, methods, operations, or processes which have been adopted or are in use, in such place of employment.”

In consideration of the mitigating factors, DOE imposes a total civil penalty of \$127,440.

As required by 10 C.F.R. § 851.42(b) and consistent with Part 851, appendix B, the violations are listed below. If this PNOV becomes a final order, SRNS must prominently post a copy of this PNOV at or near the location where the violation occurred until the violation is corrected in accordance with 10 C.F.R. § 851.42(e).

## I. VIOLATIONS

### A. Management Responsibilities and Training and Information

Title 10 C.F.R. § 851.10, *General requirements*, subsection (a), states that “[w]ith respect to a covered workplace for which a contractor is responsible, the contractor must: (1) [p]rovide a place of employment that is free from recognized hazards that are causing or have the potential to cause death or serious physical harm to workers; and (2) [e]nsure that work is performed in accordance with: (i) [a]ll applicable requirements of [Part 851]; and (ii) [t]he worker safety and health program for that workplace.”

Title 10 C.F.R. § 851.20, *Management responsibilities and worker rights and responsibilities*, subsection (a), states that “[c]ontractors are responsible for the safety and health of their workforce and must ensure that contractor management at a covered workplace:...(5) [p]rovide workers with access to information relevant to the worker safety and health program.” Subsection (b) states that “[w]orkers must comply with the requirements of this part, including the worker safety and health program, which are applicable to their own actions and conduct. Workers at a covered workplace have the right, without reprisal, to:...(2) [h]ave access to: (i) DOE safety and health publications.”

Title 10 C.F.R. § 851.25, *Training and information*, subsection (a), states that “[c]ontractors must develop and implement a worker safety and health training and information program to ensure that all workers exposed or potentially exposed to hazards are provided with the training and information on that hazard in order to perform their duties in a safe and healthful manner.” Subsection (b) states that “[t]he contractor must provide: (1) [t]raining and information for new workers, before or at the time of initial assignment to a job involving exposure to a hazard; (2) [p]eriodic training as often as necessary to ensure that workers are adequately trained and informed.”

SRNS *Health and Safety Programs Management Policy 1-01, 4.28, Revision 3, March 14, 2019, section 1.1, Policy*, states that “[t]he Performing Entities shall provide a place and condition of employment that is free from, or protected against, recognized hazards that cause or are likely to cause sickness, impaired health and well-being, or significant discomfort and inefficiency among workers.”

SRNS *Integrated Safety Management System Description (U) FY2023, SRNS-RP-2008-00087, Revision 14, August 15, 2022, section II, subsection E*, states that “Line Management has primary responsibility for safely operating facilities and conducting activities.” Section III, subsection J(2), states that “[p]rogrammatic WSHP implementation is driven by the following implementing mechanisms: Manual 1-01, Policy 4.28, Health and Safety Programs...[o]verall policy to conduct all work in compliance with 10 CFR 851 requirements and programs.”

SRNS *Worker Safety and Health Program (WSHP), S-SHP-B-00005, Revision 12, May 18, 2022*, states that “ISMS [Integrated Safety Management System] is the mechanism by which SRNS fulfills its responsibilities to provide a place of employment that is free from

recognized hazards that cause or have the potential to cause death or serious physical harm to workers, and ensures that work is performed in accordance with applicable requirements of Title 10 CFR 851, *Worker Safety and Health Program*.”

SRNS *Employee Safety Manual 8Q*, Procedure 1, *Safety Principles and Program Responsibilities*, Revision 18, June 29, 2022, section 2.0, states that “Integrated Safety Management System (ISMS) serves as the framework for performing work safely by analyzing and mitigating hazards based on the defined scope of work.” Section 4.2 states that “[m]anagement is responsible for...developing facility specific procedures, rules and training for all work activities that require additional or detailed H&S [health and safety] guidance.”

SRNS *Employee Safety Manual 8Q*, Procedure 122, *Hazard Analysis Process*, Revision 16, August 4, 2021, section 4.6, states that “[t]he LWGS [Lead Work Group Supervisor]/Manager or Designee is responsible for [a]ssisting the Planner/Initiator with work scope definition, hazard identification, and with control selection as needed.” Section 4.7 states that “[t]he Planner/Initiator is responsible for [o]btaining/establishing a clearly defined scope of work, [c]onducting walkdowns of the proposed tasks and jobsites to assess hazards and worksite conditions....” Section 5.2, paragraph 1, states that “[a] clearly defined scope of work is essential to effectively identify and analyze the hazards for activity level work. The boundaries for the scope of work associated with the hazard analysis include ... [a] description of the specific activity... [a]n adequate breakdown of the activity... [w]ork methods, tools, equipment, techniques, and their associated hazards.” Section 5.12, paragraph (4), states that “[t]he AHA [Assisted Hazard Analysis] Application User course, Web Based AHA Initial User, targets those employees who screen work against the Determination Guide within the AHA Application and/or generate, review, or approve hazard analyses and covers the following topics:... (C) [e]xpectations and requirements for defining scope of work and performing walkdowns; (D) [u]se/limitations of IHA [Individual Hazard Analysis] and use of hazard analysis in the identification of hazards and controls; (E) Determination Guide and AHA Hazard Tree content; (F) [c]ontrol selection and the application of the hierarchy of controls;... (H) [e]xpectations for response to changes in scope of work, hazards, control needs, and uncertainty.”

SRNS *Conduct of Maintenance 1Y*, Procedure 8.20, *Work Control Procedure*, Revision 35, August 25, 2022, attachment 8.3, *Expedited Work*, states that “the minimum work elements required to perform any expedited work: [includes a] [c]learly defined scope of work...Pre-Planned/approved Model Work Order or Pre-Approved Procedure is available, or neither is required because work can be performed by qualified workers per Skill of the Craft without detailed written work instructions.”

SRNS *Employee Safety Manual 8Q*, Procedure 1, *Safety Principles and Program Responsibilities*, Revision 18, June 29, 2022, section 4.2, states that “[m]anagement is responsible for...[i]mplementing the worker safety and health training and information program to ensure that all workers exposed or potentially exposed to hazards are provided with the training and information on that hazard in order to perform their duties in a safe and healthful manner. This shall include providing:...[i]nitial training and information for new

employees, before or at the time assignment to a job involving exposure to a hazard; [p]eriodic training as often as necessary to ensure that workers are adequately trained and informed; [a]dditional training when safety and health information or a change in workplace conditions indicates that a new or increased hazard exists.” Section 4.2 further states that “[m]anagement is responsible for...developing facility specific procedures, rules and training for all work activities that require additional or detailed H&S guidance.”

*SRNS Site Maintenance Training Program Description, PROGSMTMPDES000103, Revision 3, September 22, 2022, section II, subsection I.A.1, states that “[t]he goal...is to ensure that maintenance and [work planning and control] personnel possess the knowledge and skills necessary to perform their assigned responsibilities....” Subsection IB.3, states that “[t]he training program for job planning, maintenance and specialized positions requires certain knowledge.”*

Contrary to these requirements, SRNS failed to ensure work planning and control processes were sufficient to ensure work could be performed safely and that personnel were provided information to effectively recognize the hazards associated with performing diagnostic work on heating, ventilation, and air conditioning (HVAC) equipment. Specific examples include the following:

1. SRNS did not develop an adequate work planning and control process for the safe conduct of corrective maintenance activities that relied on skill of the craft work. The SRNS process allowed for the development and implementation of an inadequate corrective maintenance work package with minimal review and approval. Specifically, once the work order was converted to an expedited package, it removed additional layers of review and allowed a single individual to fulfill supervisor, planner, and approver roles, which bypassed safety-specific reviews and approvals. As a result, the burden to identify and assess hazards during skill of the craft work was solely dependent on the workers’ knowledge.
2. SRNS did not adequately train its maintenance workers on hazardous energy control during maintenance qualification processes. For example, maintenance qualification training did not address specific methods and techniques, such as removal of fan belts or chains and blocking of rotational components to safely control mechanical hazards (e.g., amputation hazards). Rather, moving a fan belt by hand was a longstanding accepted practice that was normalized through informal on-the-job training.
3. SRNS did not ensure that the methods to provide workers with information regarding known safety concerns related to HVAC equipment maintenance activities at DOE facilities were effective. Specifically, maintenance workers were not aware of information regarding previous DOE incidents of amputation, entrapment, and crushing hazards associated with moving HVAC parts. For example, workers were not provided with specific DOE Operating Experience Level 3 (OE-3) lessons-learned documents reporting these hazards.

This noncompliance constitutes a Severity Level I violation.

Base Civil Penalty – \$118,000

Proposed Civil Penalty (as adjusted) – \$68,440

## **B. Hazard Identification and Assessment and Safety and Health Standards**

Title 10 C.F.R. § 851.21, *Hazard identification and assessment*, subsection (a), states that “[c]ontractors must establish procedures to identify existing and potential workplace hazards and assess the risk of associated workers injury and illness. Procedures must include methods to:...(5) [e]valuate operations, procedures, and facilities to identify workplace hazards...[and] (6) [p]erform routine job activity-level hazard analyses.” Subsection (c) states that “[c]ontractors must perform the activities identified in paragraph (a) of this section, initially to obtain baseline information and as often thereafter as necessary to ensure compliance with the requirements in [10 C.F.R. Part 851, Subpart C].”

Title 10 C.F.R. § 851.23, *Safety and health standards*, subsection (a), states that “[c]ontractors must comply with the following safety and health standards that are applicable to the hazards at their covered workplace:... (3) Title 29 CFR, part 1910, ‘Occupational Safety and Health Standards’.”

Title 10 C.F.R. § 1910.146 *Permit-required confined spaces (CS)*, subsection (c)(1), states that “[t]he employer shall evaluate the workplace to determine if any spaces are permit-required confined spaces.”

Title 29 C.F.R. § 1910.147 *The control of hazardous energy (lockout/tagout)*, subsection (c)(1), states that “[t]he employer shall establish a program consisting of energy control procedures, employee training and periodic inspections to ensure that before any employee performs any servicing or maintenance on a machine or equipment where the unexpected energizing, start up or release of stored energy could occur and cause injury, the machine or equipment shall be isolated from the energy source, and rendered inoperative.” Subsection (c)(4)(ii) states that “[t]he procedures shall clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized for the control of hazardous energy, and the means to enforce compliance.” Subsection (c)(7)(i)(A) states that “[e]ach authorized employee shall receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.”

SRNS *Integrated Safety Management System Description (U) FY2023*, SRNS-RP-2008-00087, Revision 14, August 15, 2022, section III, subsection H, principle 5, states that “[b]efore work is performed, the associated hazards are identified and evaluated, and an agreed-upon set of safety standards and requirements are established which, if properly implemented, provide adequate assurance that...the workers...are protected from adverse consequences.”

SRNS *Employee Safety Manual 8Q, Procedure 1, Safety Principles and Program Responsibilities*, Revision 18, June 29, 2022, section 4.2, states that “[m]anagement is responsible for:...[p]rotecting workers from dangerous safety and health conditions;...[c]ommunicating to employees how unusual conditions and hazards will be addressed for correction and advising the area Safety Engineer that these conditions and hazards might apply to other site areas.”

SRNS *Employee Safety Manual 8Q, Procedure 122, Hazard Analysis Process*, Revision 16, August 4, 2021, section 4.6, states that “[t]he LWGS/Manager...is responsible for [a]ssisting the Planner/Initiator with work scope definition, hazard identification, and with control selection as needed...[e]nsuring that workers are knowledgeable of the hazards and controls.” Section 4.7 states that “[t]he Planner/Initiator is responsible for [o]btaining/establishing a clearly defined scope of work, [c]onducting walkdowns of the proposed tasks and jobsites to assess hazards and worksite conditions...” and “[a]pplying the hierarchy of controls...” Section 5.1, paragraph 4, states that “[a]n IHA will end at the Determination Guide and will not go through the Hazard Tree. The expectation is that the key elements of the IHA Process are adequate to perform work safely.” Section 5.2, paragraph 5, states that “[i]n the AHA Application, the proposed scope of work consists of a Main Task that can be divided into Subtasks for the accurate identification and placement of hazards and controls.” Section 5.3.1, paragraph 1, states that “[a]fter the scope of work for an activity has been well defined, the hazards are identified to which the workers will be exposed.”

SRNS *Conduct of Maintenance 1Y, Procedure 8.20, Work Control Procedure*, Revision 35, August 25, 2022, section 4.19, states that “[t]he Planner is responsible for: Assisting with identifying hazards and applying the hierarchy of controls for hazards that cannot be eliminated applicable to the work scope per Manual 8Q, Procedure 122” and “[i]ncorporating applicable hazards and controls into the work package.”

SRNS *Employee Safety Manual 8Q, Procedure 32, Hazardous Energy Control (Lockout/Tagout)*, Revision 27, June 11, 2020, section 1.0, states that “The primary purpose of this procedure is to provide a system of hazardous energy control (HEC) for the protection of personnel. This procedure provides instructions for the isolation and restoration of equipment and systems to protect personnel from injury during maintenance, testing, inspections, training and similar activities.”

SRNS *Employee Safety Manual 8Q, Procedure 33, Confined Space Entry Program*, Revision 26, December 14, 2021, section 4.3, states that “[t]he CS [Confined Space] Coordinator is responsible for...ensuring an evaluation has been performed on all facility CSs [confined spaces] using OSR 20-169, Confined Space Identification Checklist.” Section 4.9 states that “[t]he Facility Manager (or Designee) is responsible for identifying all CSs within their area of responsibility.” Section 5.2.1 states that “[t]he CSRB [Confined Space Review Board] reviewed and concurred that a graded approach shall be used to determine classification of air handling units and generator units as CSs.” Section 5.2.1 further states that “[e]ach unit’s configuration, location or design should be evaluated against the three CS criteria” and “[e]valuation and determination shall be documented on OSR 20-169.”



Contrary to these requirements, SRNS failed to effectively identify and assess hazards related to the entire HVAC maintenance evolution. Specific examples include the following:

1. SRNS did not establish a clearly defined scope of work that sufficiently identified the main tasks and subtasks for corrective maintenance activities that relied on skill of the craft work. Specifically, the work order task instructions documented three tasks: lockout/tagout of the electrical energy source, removal of the fan belt guard, and barricading the air handling unit (AHU) #1 with ‘no entry’ signage. However, the investigation revealed the work crew planned additional tasks and subtasks to address the noise and vibration in AHU#1. Additionally, the abbreviated Assisted Hazard Analysis, used for work package 01986960, identified electrical hazards, but did not identify pinch point and rotating equipment hazards that were reintroduced when the fan belt was pulled. As a result, additional controls to render the fan system inoperative, while still allowing components to move for diagnostic purposes, were not considered.
2. SRNS did not identify that the HVAC maintenance activity involved entry into a permit-required confined space and did not initiate the permitting and review procedures to address associated hazards. SRNS had not evaluated H-Area building 221 AHU#1 to determine whether the conditions met the criteria of a permit-required confined space. Categorization of AHU#1 as a confined space would have triggered additional reviews and prevented the work package from being expedited. Consequently, workers entered a confined space with uncontrolled hazards during the corrective maintenance activity. Following the Office of Enforcement investigation, SRNS determined that AHU#1 met the criteria of a permit-required confined space.

This noncompliance constitutes a Severity Level I violation.

Base Civil Penalty – \$118,000

Proposed Civil Penalty (as adjusted) – \$59,000

## II. REPLY

Pursuant to 10 C.F.R. § 851.42(b)(4), SRNS is hereby obligated to submit a written reply within 30 calendar days of receipt of this PNOV. The reply should be clearly marked as a “Reply to the Preliminary Notice of Violation.”

If SRNS chooses not to contest the violations set forth in this PNOV and the proposed remedy, then the reply should state that SRNS waives the right to contest any aspect of this PNOV and the proposed remedy. In such case, the total proposed civil penalty of \$127,440 must be remitted within 30 calendar days after receipt of this PNOV. Remittance of payment must be submitted via Electronic Funds Transfer (EFT) or ACH Transfer to the Department of Energy through the U.S. Treasury. The Office of Enforcement must be copied at [enforcementdocketclerk@hq.doe.gov](mailto:enforcementdocketclerk@hq.doe.gov) when the electronic payment is submitted to the U.S. Treasury. Instructions for remitters sending payments in U.S. dollars via EFT or ACH Transfer are enclosed. This PNOV will constitute a final order upon the filing of the reply.

If SRNS disagrees with any aspect of this PNOV, including the proposed civil penalties, then as applicable and in accordance with 10 C.F.R. § 851.42(c)(1), the reply must: (1) state any facts, explanations, and arguments that support a denial of an alleged violation; (2) demonstrate any extenuating circumstances or other reason why the civil penalties should not be imposed or should be further mitigated; and (3) discuss the relevant authorities that support the position asserted, including rulings, regulations, interpretations, and previous decisions issued by DOE. In addition, 10 C.F.R. § 851.42(c)(2) requires that the reply include copies of all relevant documents.

If SRNS fails to submit a written reply within 30 calendar days of receipt of this PNOV, then pursuant to 10 C.F.R. § 851.42(d), SRNS relinquishes any right to appeal any matter in this PNOV and this PNOV will constitute a final order.

Please submit your reply to the Director, Office of Enforcement by email to [enforcementdocketclerk@hq.doe.gov](mailto:enforcementdocketclerk@hq.doe.gov).

A copy of the reply should also be sent to the Manager of the DOE Savannah River Site Office.

### III. CORRECTIVE ACTIONS

Corrective actions that have been or will be taken to avoid further violations should be delineated with target and completion dates in DOE's Noncompliance Tracking System.



Anthony C. Pierpoint  
Director  
Office of Enforcement  
Office of Enterprise Assessments

Washington D.C.  
This 3rd day of April 2024